CESTODES IN THE COLLECTION OF THE LIVERPOOL SCHOOL OF TROPICAL MEDICINE

BY

T. SOUTHWELL

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Sub-order **Univitellata** Southwell, 1925.

Family HYMENOLEPIDIDAE Railliet and Henry, 1909.

Sub-family (*a*) DIPYLIDIINAE Stiles, 1896.

Genus *Pancerina* Fuhrmann, 1899.

Pancerina varanii (Stossich, 1895) Sonsino, 1895.

Four specimens of this worm from *Varanus griseus*, Palestine, December, 1925, collected and presented by Dr. S. Adler.

The anatomy of the worm is illustrated in figs. 1, 2 and 3.

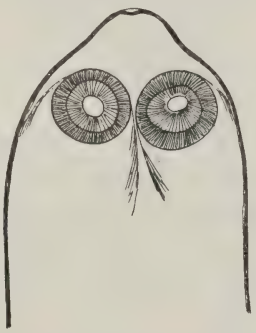

FIG. 1. *Pancerina varanii*. Head. × 56.

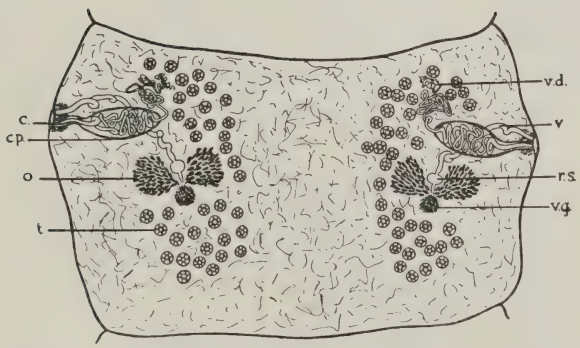

FIG. 2. *Pancerina varanii*. Mature segment. *c.*—cirrus; *c.p.*—cirrus pouch; *v.d.*—vas deferens; *t.*—testes; *v.*—vagina; *o.*—ovary; *r.s.*—receptaculum seminis; *v.g.*—vitelline glands. × 56.

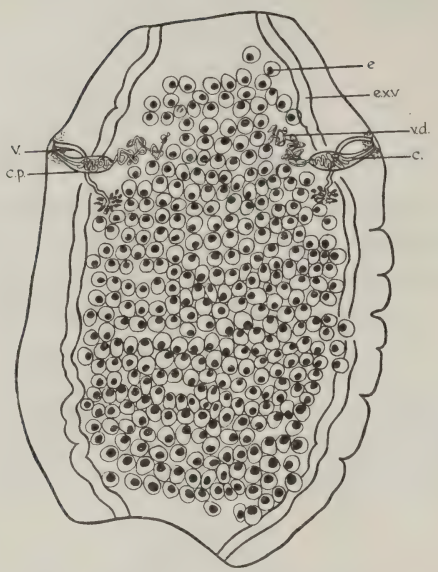

Fig. 3. *Pancerina varanii*. Gravid segment. *c.*—cirrus; *c.p.*—cirrus pouch; *v.d.*—vas deferens; *v.*—vagina; *e.*—eggs; *ex.v.*—excretory vessel. × 35.

Sub-family (*b*) Hymenolepidinae Ransom, 1909.

Genus *Hymenolepis* Weinland, 1858.

Hymenolepis lloydi n.sp. Figs. 4, 5 and 6.

Four fragmented worms, with scolices, from the intestine of 'a large stork.' Azare, N.P. Nigeria, 21.x.25. Collected and presented by Dr. Ll. Lloyd.

External anatomy. The exact length of the worms could not be determined, but they are small and probably measure from 1 cm. to 2 cm. in length; the greatest breadth is 0·2 mm. The segments are numerous and they are all much broader than long; the genital pores are unilateral and are situated near the anterior margin of the segment.

Head. The head is globular and prominent; it measures 0·6 mm. in length and 0·35 mm. in breadth. The rostellum, when protruded, measures 0·18 mm. in length and 0·16 mm. in breadth. It is armed with twenty sickle-shaped hooks which vary in size from 110μ to 140μ. There is no neck.

Internal anatomy. Details of the muscular, nervous and excretory systems were not investigated, but it was noted that the muscular system was feebly developed.

Male genitalia. There are three large globular testes almost in a row ; in Mayhew's classification (1925) the worm falls in the genus *Hymenolepis.* The cirrus pouch is very large and prominent and extends almost half-way across the segment. Inside the pouch the

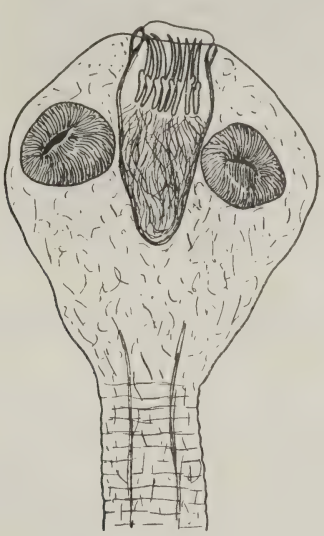

Fig. 4. *Hymenolepis lloydi*, n.sp. Head. × 75.

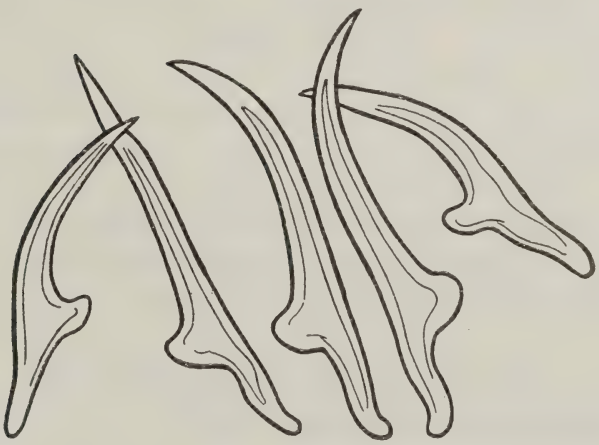

Fig. 5. *Hymenolepis lloydi*, n.sp. Hooks. × 330.

vas deferens is somewhat coiled and terminally it dilates into a small seminal vesicle. Outside the pouch the vas deferens is very long and

coiled and extends to the distal excretory vessel. No external seminal vesicle was seen.

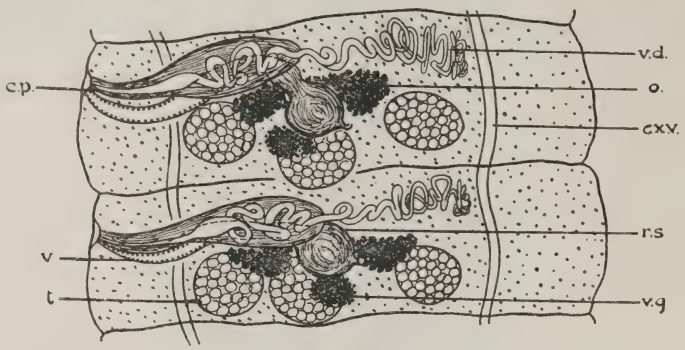

Fig. 6. *Hymenolepis lloydi*, n.sp. Mature segment. *c.p.*—cirrus pouch; *v.d.*—vas deferens; *t.*—testes; *v.*—vagina; *o.*—ovary; *v.g.*—vitelline glands; *r.s.*—receptaculum seminis; *ex.v.*—excretory vessel. × 210.

Female genitalia. The ovary develops rather late and is a bilobed organ. From the pore the vagina dilates into a wide tube running ventral to the cirrus pouch; between the ovarian lobes it again dilates into a very large muscular receptaculum seminis. The vitelline gland is conspicuous and is situated posterior to the ovary.

Uterus. This organ was not fully developed in any of the available segments. It consisted of a narrow transverse tube situated in front of the ovary. No eggs were seen.

Diagnosis. This species differs from all known species of the genus *Hymenolepis* in the number and size of the hooks.

The writer has pleasure in naming the worm in honour of Dr. Ll. Lloyd, to whom the School of Tropical Medicine is indebted for various collections of parasites obtained in Nigeria.

The type specimens, stained and mounted, are in the collections of the Liverpool School of Tropical Medicine.

Sub-order **Multivitellata** Southwell, 1925.

Family PROTEOCEPHALIDAE La Rue, 1914.

? *Proteocephalus pentastomum* Klaptocz, 1906.

One mature but non-gravid specimen of what appears to be this species from the small intestine of a siluroid mud-fish. Azare,

N.P. Nigeria, 11.xi.25. Collected and presented by Dr. Ll. Lloyd. The worm was strongly contracted and on this account it was impossible to make a definite diagnosis.

Proteocephalus gallardi Johnstone, 1911.

Numerous specimens presented by Dr. Ll. Lloyd from the intestines and inside pericardium of frogs. Azare, N.P. Nigeria. Collected on the following dates : 7 August, 1925, and 28 December, 1925.

It was at first thought that the worms were specimens of *P. hylae* (Johnstone, 1912), but a careful examination showed that they differed from that species (1) in size, (2) in the head being armed with innumerable spinules, and (3) in the cirrus being sometimes anterior and sometimes posterior to the vagina, whereas in *P. hylae* ' the male pore lies postero-dorsally to the female aperture, both terminating in a very short genital cloaca.'

Johnstone obtained *P. gallardi* from a black snake (*Pseudechis porphyriacus*) in Australia. It is now recorded from an African frog.

The writer was struck with the improbability of the same species occurring in both a snake and a frog, and in such widely separated areas, but the anatomy of the worm leaves no room for doubt.

The specimens measured over 40 cm. in length, and the head bore a terminal depression (apical organ).

Of doubtful systematic position :—

Genus *Diploposthe* Jacobi, 1896.

Diploposthe laevis (Bloch, 1782) Jacobi, 1896. Figs. 7 to 10.

One specimen from a ' small heron (*Ardea* sp.).' Azare, N.P. Nigeria, 20.viii.25. Collected and presented by Dr. Ll. Lloyd.

The specimen was peculiar in that in the anterior half of the strobila only a single set of male genital organs were present and these were unilateral. About the middle of the length of the worm the second set of male genitalia appeared suddenly, but irregularly. Posteriorly a double set of male genitalia was present in all segments except in four which bore a single set.

The female genital organs appeared about the middle of the

length of the worm : they were normal, except that in a few of the most posterior segments portions of the ovary had not atrophied and they were a conspicuous feature of segments in which otherwise only the cirrus pouches and uterus were visible.

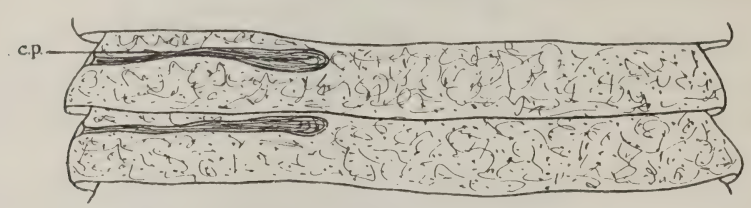

Fig. 7. *Diploposthe laevis.* Immature segment showing single male genitalia. *c.p.*—cirrus pouch. × 75.

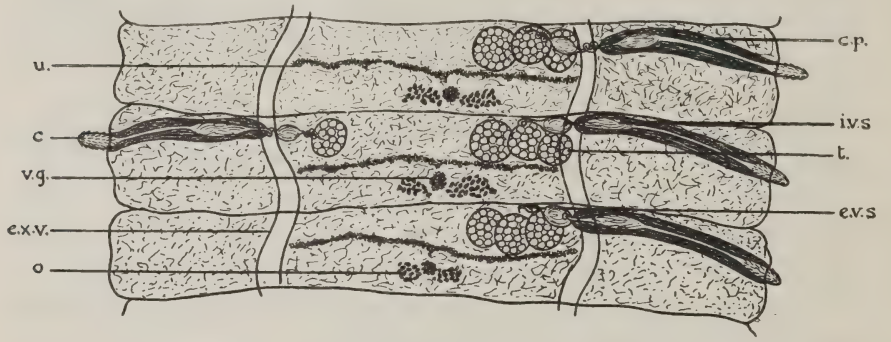

Fig. 8. *Diploposthe laevis.* Mature segment showing single and double genitalia. *c.p.*—cirrus pouch ; *c.*—cirrus ; *i.v.s.*—internal vesicula seminalis ; *e.v.s.*—external vesicula seminalis ; *t.*—testes ; *o.*—ovary ; *v.g.*—vitelline glands ; *u.*—uterus ; *ex.v.*—excretory vessel. × 35.

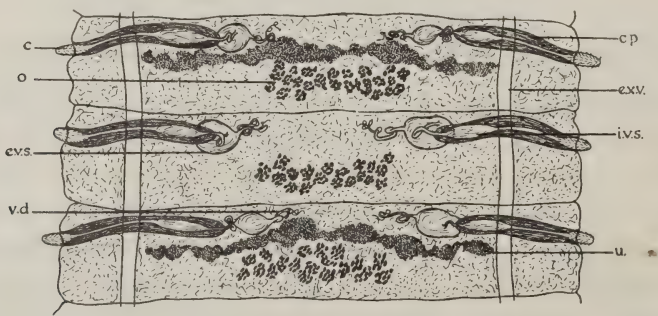

Fig. 9. *Diploposthe laevis.* Mature segment. *c.*—cirrus ; *c.p.*—cirrus pouch ; *i.v.s.*—internal vesicula seminalis ; *e.v.s.*—external vesicula seminalis ; *v.d.*—vas deferens ; *o.*—ovary ; *u.*—uterus ; *ex.v.*—excretory vessel. × 28.

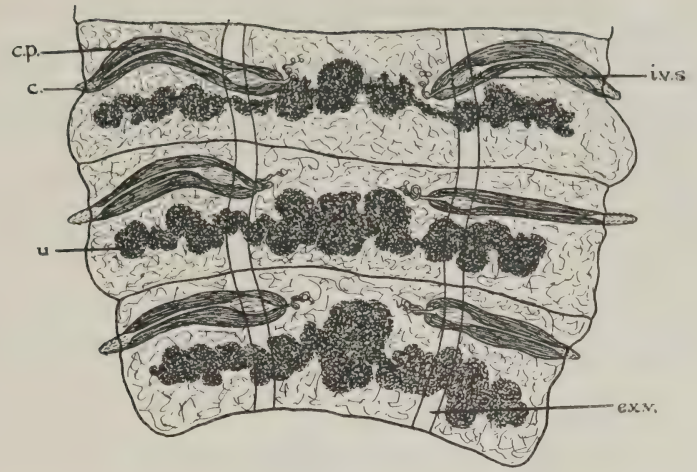

Fig. 10. *Diploposthe laevis.* Nearly gravid segment. *c.*—cirrus; *c.p.*—cirrus pouch; *i.v.s.*—internal vesicula seminalis; *u.*—uterus; *ex.v.*—excretory vessel. × 35.

REFERENCES

Baylis, H. A. (1919). On two new species of the cestode genus *Oochoristica* from lizards. *Parasitology*, Vol. XI, Nos. 3 and 4, pp. 405-414.

Fuhrmann, O. (1906). Die Hymenolepis-Arten der Vögel. *Centralbl. f. Bakt.* I. Abt. Orig. Bd. XLI, Heft 3, pp. 352-358. Heft 4, pp. 440-452. Bd. XLII, Heft 7, pp. 620-628. Heft 8, pp. 730-755. Jena.

——— (1906). Bekannte und neue Arten und Genera von Vogeltänien. *Centralbl. f. Bakt.* I. Abt. Orig. Bd. XLV. Heft 6, pp. 516-536. Jena.

——— (1908). Nouveaux Ténias d'Oiseaux. *La Revue Suisse de Zoologie*, Vol. I, No. 16, pp. 1-73. Geneva.

——— (1908). Die Cestoden der Vögel. *Zool. Jahrbuch*, Supplementband X, Heft 1. Jena.

——— (1911). Vogelcestoden der Aru-Inseln. *Abhandlungen der Senckenbergischen Naturforschenden Gesellschaft.* Bd. XXXIV, H. Merton. *Ergebnisse einer zoologischen Forschungsreise in den Sudöstlichen Molukken.* Bd. II.

——— (1912). Ergebnisse der mit Subvention aus der Erbschaft Treitl unternommenen zoologischen Forschungsreise Dr. Franz Werners nach dem ägyptischen Sudan und Nord-Uganda. *Sitzungsbericht der kaiserl. Akad. Wissensch. in Wien. Mathem.-Naturw. Klasse.* Bd. CXXI, I. Abt. pp. 1-12. Wien.

——— (1913). Nordische Vogelcestoden aus dem Museum von Goteborg. *Meddel. fr. Goteborgs Mus. Zool.* Affd. I.

——— (1913) Vogelcestoden. Résultats de l'Expédition Scientifique Néerlandaise à la Nouvelle-Guinée. *Zoologie*, Vol. IX, Liv. 3.

——— (1918). Cestodes d'oiseaux de la Nouvelle Calédonie et des Iles Loyalty. F. Sarasin and J. Roux, Nova Caledonia. *Zoologie*, Vol. XI, Liv. IV, No. 14.

Janicki, C. V. (1905). Studien an Saügetiercestoden. *Zeitschr. f. Wissensch. Zool.*, Bd. LXXXI, pp. 505-597. Leipzig.

Johnston, T. H. (1911). *Proteocephalus gallardi*, a new cestode from the snake. *Ann. Queensland Mus.*, No. 10. Brisbane.

——— (1912). On a Re-examination of the Types of Krefft's Species of Cestoda in the Australian Museum, Sydney. *Rec. Austral. Mus. Sydney, N.S.W.*, Part I, pp. 1-6.

——— (1913). Notes on some Entozoa. *Proc. Roy. Soc., Queensland*, Vol. XXIV, pp. 62-91. Brisbane.

La Rue, G. R. (1914). A Revision of the Cestode Family Proteocephalidae. *Illinois Biol. Monogr.*, Vol. I, Nos. 1 and 2. Illinois.

Lühe, M. (1910). *Die Süsswasserfauna Deutschlands : Parasitische Plattwurmer*, Heft 18. Jena.

Mayhew, R. L. (1925). Studies on the Avian Species of the Cestode Family *Hymenolepididae. Illinois Biol. Monogr.*, Vol. X, No. 1. Illinois.

Meggitt, F. J. (1920). A New Species of Cestoda (*Oochoristica erinacei*) from the hedgehog. *Parasitology*, Vol. XII, No. 3, pp. 310-313.

Ransom, B. H. (1909). The Taenioid Cestodes of North American Birds. *Smithsonian Institution United States National Museum*, Bull. 69. Washington.

Skrjabin, K. I. (1914). Beitrag zur Kenntnis einiger Vogelcestoden. *Centralbl. f. Bakt.* I. Abt. Orig. Bd. 75, Heft I, pp. 59-83. Jena.

——— (1914). Vogelcestoden aus Russisch Turkestan. *Zoolog. Jahrbuch.* Bd. XXXVII. Abt. f. Syst., pp. 411-492. Jena.

Woodland, W. N. F. (1925). On Three New Proteocephalids (Cestoda) and a Revision of the Genera of the Family. *Parasitology*, Vol. XVII, No. 4, pp. 370-394.